

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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Applicants: Yong Suk Choi et al. Docket No.: 01-563

Serial No.: Examiner :

Filed : Art Unit :

For : POLYMERIC REFERENCE ELECTRODE MEMBRANE AND REFERENCE  
ELECTRODE WITH THE MEMBRANE

#2  
01/11/02

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INFORMATION DISCLOSURE STATEMENT

Hon. Commissioner of Patents & Trademarks  
United States Patent & Trademark Office  
Washington, D.C. 20231

Dear Sir:

In accordance with the requirements of 37 CFR 1.97 and 1.98,  
Applicants hereby submit the prior art listed hereinbelow, copies  
enclosed.

- (1) An article entitled "Promising New Solid-State  
Reference Electrode", By K. Nagy et al., published by  
J. Electrochem. Soc., Vol. 144, No. 1, January 1997,  
pp. L1-L2. This article discloses a solid-state  
reference electrode which has been constructed and  
tested. Experiments have shown that the reference  
electrode gives a negligible and constant contribution  
to the measured EMF. The solid-state reference  
electrode was used as a reference electrode for an

Orion Fluoride ( $F^-$ ) selective electrode. This cell behaves satisfactorily compared to an Orion  $F^-$ -combination electrode. The first promising progress has therefore been made toward realization of a new solid-state reference electrode.

- (2) An article entitled "Fabrication and Characterization of a Solid State Reference...", By Melissa A. Nolan et al., published by Analytical Chemistry, Vol. 69, No. 6, March 15, 1997, pp. 1244-1247. This article discloses as an alternative to standard commercial reference electrodes, a solid state reference electrode which is fabricated for in situ voltammetric analysis in solutions containing little or no added supporting electrolyte. In the fabrication process, a Ag/AgCl wire is coated with an electrolyte immobilized and protected with Nafion or polyurethane. The electrode potential is measured as a function of time, ionic strength, and pH. A stable potential is obtained for Nafion and polyurethane within 30-35 min in water. Both the polyurethane and Nafion solid state reference electrodes are stable for at least 90 days, but the Nafion electrode fluctuates more than the polyurethane electrode. The electrode is demonstrated using square

wave anodic stripping voltammetry at a large electrode (3 mm), an ultramicroelectrode (10  $\mu\text{m}$ ), and an array of ultramicroelectrodes.

- (3) An article entitled "Thick film silver-silver chloride reference electrodes", By A. W. J. Cranny et al., published by Meas. Sci. Technol., Vol. 9 (1998) pp. 1557-1565. This article discloses the fabrication of prototype thick film silver-silver chloride electrochemical reference electrodes. Combinations of commercially available and proprietary thick film pastes have been used in their construction in a multi-layer planar configuration modeled upon the structure of the classic single junction silver-silver chloride reference electrode cell. Several variations in the basic electrode design were fabricated, involving combinations of one of three different paste formulations of the silver-silver chloride layer coupled with one of two combinations of paste formulation for the salt containment matrix. The relative performances of these different versions of reference electrode were evaluated in terms of their chloride ion sensitivity, hydration times required to achieve a stable potential and useable lifetime. It is

shown that, depending on the processing methodology employed at certain stages in the fabrication of these devices, a large degree of variation in characteristics can be achieved and therefore exploited in the design of reference electrodes suitable for a range of specific applications.

The undersigned submits the above-identified references for independent consideration by the Examiner and does not make any admission that these references are or are not material to the present invention or that these references are or are not prior art with respect to the present invention.


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on September 21, 2001  
(Date of Deposit)  
Rachel Piscitelli  
Name and Reg. No. of Attorney  
Rachel Piscitelli  
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Date of Signature

Respectfully submitted,

Yong Suk Choi et al.

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Date: September 21, 2001

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